SOIL AND MOISTURE CONSERVATION PLAN

OTTAWA NATIONAL WILDLIFE REFUGE

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF SPORT FISHERIES AND WILDLIFE

FISH AND WILDLIFE SERVICE

OAK HARBOR, OHIO

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PART I: PROGRAM RELATION TO REFUGE OBJECTIVES

A. REFUGE OBJECTIVES

Ottawa National Wildlife Refuge was established to preserve vital deminishing Lake Erie Marshes for the benefit of Migratory Waterfowl. Initial land acquisition was in July 1961 and at this time (1972), 5,518 acres of the total acreage approved by The Migratory Bird Conservation Commission have been acquired, with about 200 acres yet to be purchased.

The primary objectives of the refuge are to provide food, water and cover for breeding and migrating waterfowl associated with the southwest portion of Lake Erie. Secondary objectives are to preserve undisturbed habitat for nesting Bald Eagles, provide habitat for other migratory birds and resident wildlife species, and to provide opportunity for the public to observe wildlife in its natural habitat.

B. RELATION OF SOIL AND MOISTURE CONSERVATION PROGRAM TO OBJECTIVES

Management objectives are to establish and maintain habitat to provide the necessary food and protection for migrant waterfowl during spring and fall periods while also maintaining necessary habitat for nesting waterfowl and for resident wildlife species. The loss of the natural wetlands through agricultural developments in previous years, with the resultant losses in production of natural wildlife foods, makes it essential that supplemental foods, in form of farm crops, be produced on cropland acres of the refuge, if management objectives are to be met. The Soil and Moisture Conservation Program complements the general refuge operations program in that the primary purpose of this plan is to restore, improve and maintain soil, water and vegetation conditions, so that maximum productivity, consistant with recommended conservation practices, can be attained. Implementation of this plan will provide for maximum production of supplementary wildlife foods on the croplands, and maintenance of wetland areas, while insuring condition and quality of habitat is improved and maintained for the future.

PART II: PROGRAM POLICIES AND ADMINISTRATIVE CONTROLS

A. POLICIES LIMITING OR DIRECTING PROGRAM

By definition, Soil and Moisture Conservation Funds are to be utilized specifically for accomplishment of soil and moisture conservation activities. The primary purpose of the program is restoration, maintenance and improvement of depleted soil and water conditions, whereby a program with the purpose primarily for wildlife benefits, rather than to correct a depleted condition, would be funded by Bureau Funds.

B. ADMINISTRATIVE CONTROLS

1. FUNDS: Projects recommended in this plan are limited by the allotment of required Soil and Moisture Conservation Funds and Operation and Maintenance Funds allotted by The Bureau for management of refuge lands and waters. Additional controls are present in the governing guidelines which define practices for which Soil and Moisture Conservation Funds may be used, and those practices for which Soil and Moisture Conservation Funds are limited to providing technical assistance only. All current guidelines for proper appropriation of Soil and Moisture Conservation Funds will be followed in implementation of this plan.

2. RELATIONSHIP TO LOCAL SOIL CONSERVATION DISTRICTS: The Ottawa Refuge is located in Lucas and Ottawa Counties, Ohio. Lucas County Soil Conservation District was only recently established, with offices in Maumee, Ohio. Close liason with The Ottawa County Soil Conservation District, with offices in Oak Harbor, Ohio, has been maintained and a harmonious relationship has been established. It has been possible to include all Ottawa Refuge lands in The Ottawa County District so that technical assistance is available for all refuge lands through one Soil Conservation District.

PART III: PROGRAM DESCRIPTION, PROBLEMS, CONTROLS

A. DESCRIPTION OF REFUGE

Ottawa National Wildlife Refuge, located along the southwestern shore of Lake Erie in north-central Ohio, will contain about 5,700 acres when land acquisition is completed. At this time 5,518 acres of the approved acreage have been acquired.

The refuge lies in an old lake plain which under primeval conditions was a large prairie marsh that extended from Detroit, Michigan to Sandusky, Ohio. Early settlers knew the Lake Erie Marshes as the "Black Swamp" and this area was the last to be settled in the Northwest Territory.

Soils are of glacial and lacustrine derivation. The dark top soil is derived from lake deposited silts and clays which are generally calcareous. Some marsh areas have top soil consisting of soft clayey black peat. Sub-soils consist mainly of brown and gray colored clays. These soils are fertile but are heavy textured and relatively impervious.

As the refuge lies in the former bed of a postglacial lake, the topography is extremely flat with low gradient, sloping gently from Lake Erie southward at a rate of two to five feet per mile.

Lake Erie moderates the local climate. The climate is humid with warm summers and mildly cold winters. The average frost-free period is 190 days between April 20 and October 30. Precipitation averages about 34 inches annually and generally is well distributed throughout the year. The average maximum wind velocity is 34 MPH, but severe storms with winds exceeding 60 MPH are common.

B. PAST LAND USE PRACTICES

First efforts to drain the "Black Swamp" were initiated about 1850. Favorable climate and fertile soils tempted farming interests, and extensive drainage systems were developed and timber was removed so lands could be converted to crop production. By 1870, 30 miles of shoreline swamps had been drained by canals with pumping facilities. Industry, recreation, and urban expansion followed until only about 30,000 acres of the estimated original 300,000 acres of marsh remained.

A narrow fringe of marsh was preserved during this expansion period for waterfowl hunting by private hunting clubs, some of which have existed nearly 100 years. Commercial muskrat trapping has also been conducted on these marshes.

Land development for farming, inspired intensive drainage systems and former marshlands were ditched, diked and tiled, with provision for pumping surplus waters into Lake Erie. Under these conditions, productivity was high and risks low. With proper drainage and protection, climate and soils are favorable for production of fruits, truck crops, corn, soybeans, sugar beets, cereal grains and hay, and it was not uncommon for an individual farmer to produce all the above, plus having some dairy cattle and other livestock.

C. ECONOMIC RELATION OF REFUGE TO THE COMMUNITY

The economy of Ottawa County is closely tied to agriculture, and Lucas County lands in the immediate refuge area are still largely agricultural. The refuge farming program which will return an estimated $60,000.00 annually to cooperative farmers is of considerable importance to the local economy. Additional economic benefits to the community are received from fur harvest and general operation and maintenance expenses of the refuge. Recreational benefits, though intangible, may contribute far greater benefits to the community than the economic benefits.

Revenue sharing with Ottawa and Lucas Counties totals $36,000.00 annually.

D. PROBLEMS IN SOIL AND MOISTURE CONSERVATION

Years of intensive row-cropping and fall plowing prior to establishment of the refuge encouraged erosion and depleted basic soil fer-

tility. Progress to date under the Soil and Moisture Conservation Program has been encouraging, but soils will require continued treatment to maintain and improve fertility, and to prevent encroachment of brush and noxious weeds. Some of the poorer soils should be retired from crop production and seeded to permanent grasses, or possibly should be re-forested with native tree species.

Stream banks and the Lake Erie shorelines exhibit rapid erosion each year. Stabilization of banks and shoreline, with protection from future erosion, is an important need under this program.

Practically all refuge lands are diked, ditched, and pumped for control of excess water. At time of land acquisition, most of these "improvements" were of sub-standard construction and/or had been permitted to deteriorate over the past 30 years. The result was silted ditches, eroded dikes overgrown with trees and brush, and inadequate or inoperative pumping facilities. Much work remains to remedy this problem for effective soil and water conservation.

Tiling of croplands to improve drainage of excess sub-surface waters is essential for consistent high productivity. Nearly 1,000 acres of croplands are inadequately tiled or have no tiling at all.

E. PROGRAM SOLUTIONS - NEEDS

1. SUMMARY OF TOTAL NEEDS: Continued application of recommend soil conservation practices will eliminate erosion and improve the basic soil fertility on refuge croplands. Recommended, and required, practices include proper crop rotations, use of winter cover crops, weed and brush control and use of commercial fertilizers and lime. This will be accomplished primarily with cooperator funds with technical assistance from Bureau Funds.

   Streambank stabilization will require extensive shaping, seeding and in some areas, extensive rip-rapping to halt erosion that now occurs from excess flows, high water levels, and periodic storms. Stabilization of the Lake Erie shoreline and barrier beach will require repair or replacement of jetties or groins.

   Water management needs under the Soil and Moisture Conservation Program are extensive and expensive. Canal and ditch systems, developed independently by previous land owners, need extensive cleaning of silt deposits, sloping of ditch banks, and seeding to limit future erosion. Existing dikes will require major reconstruction to bring them up to standard dimension and must be seeded to limit erosion of the slopes. Pumping facilities must be up-graded, and in many areas can be combined to eliminate inefficient facilities, while providing efficient outlets for excess waters from most refuge croplands.

Proper tiling of croplands is needed in conjunction with improved pumping facilities. Program costs will be shared between Bureau Funds and Soil and Moisture Conservation Funds, with Soil and Moisture Conservation Funds utilized primarily for erosion control and operation and maintenance of the facility.

2. PROGRAM DURATION: This plan has a programmed duration of six years, Fiscal Years 1973 - 1978, to coincide with and complement the refuge objectives and program scheduling process.

PART IV: PROGRAM UNITS

SOIL AND MOISTURE CONSERVATION PROGRAM

A. TOTAL NEEDS - FISCAL YEARS 1973-78

I. PLANNING AND INVESTIGATION ACTIVITIES

A. LAND USE PLANNING

ITEM	UNIT	TOTAL NEED	TOTAL FUNDS
Capability Classification	(Acres)	8,000	$ 1,000.00
Conservation Plans	(Acres)	5,000	-
Surveys	(Acres)	5,000	5,000.00
Meetings	(No.)	10	1,000.00
		Sub-total:	$ 7,000.00

B. STUDIES AND INVESTIGATIONS

ITEM	UNIT	TOTAL NEED	TOTAL FUNDS
Actions, Major	(No.)	1	$ 3,000.00
Actions, Minor	(No.)	300	5,200.00
Reports, Major	(No.)	2	500.00
Reports, Minor	(No.)	30	1,500.00
		Sub-total:	$10,200.00

II. APPLICATION OF PRACTICES

A. SOIL MANAGEMENT

ITEM	UNIT	TOTAL NEED	TOTAL FUNDS
Brush Control	(Acres)	250	$ 15,000.00
Cover Crops	(Acres)	2,000	36,000.00
Cropping Systems	(Acres)	2,000	12,000.00
Crop Residues	(Acres)	2,000	36,000.00

A. SOIL MANAGEMENT (Continued)

ITEM	UNIT	TOTAL NEED	TOTAL FUNDS
Fertilizers	(Acres)	2,000	$120,000.00
Seeding and Sodding	(Acres)	300	18,000.00
Soil Amendments	(Acres)	2,000	18,000.00
Strip Cropping	(Acres)	2,000	- -
Weed Control	(Acres)	2,000	24,000.00
		Sub-total:	$280,100.00

B. WATER MANAGEMENT

ITEM	UNIT	TOTAL NEED	TOTAL FUNDS
Bank Protection	(Ft.)	60,000	$150,000.00
Dike and Levee	(Ft.)	100,000	500,000.00
Drainage, Main & Lateral	(Ft.)	100,000	248,000.00
Drainage Area Improved	(Acres)	5,000	- -
Tile Drain	(Ft.)	5,000	100,000.00
		Sub-total:	$998,000.00

C. PROGRAM FACILITIES

ITEM	UNIT	TOTAL NEED	TOTAL FUNDS
Bridges	(No.)	4	$ 20,000.00
Roads	(Miles)	14	150,000.00
Study Plots	(No.)	5	3,000.00
Other (Pumps)	(No.)	6	30,000.00
		Sub-total:	$ 203,000.00

D. PROGRAM OPERATION AND MAINTENANCE: $ 29,700.00

TOTAL FUNDS: $1,528,000.00

B. TOTAL FUNDS BREAKDOWN

FY-1973 - 1978

ITEM	S&MC	BUREAU	COOP	TOTAL
Land Use Planning	$ - -	$ 7,000.00	$ - -	$ 7,000.00
Studies & Investigations	5,200.00	5,000.00	- -	10,200.00
Soil Management	24,100.00	41,000.00	215,000.00	280,100.00
Water Management	35,000.00	915,000.00	48,000.00	998,000.00
Program Facilities	- -	203,000.00	- -	203,000.00
Operations & Maintenance	4,700.00	20,000.00	5,000.00	29,700.00
TOTALS	$69,000.00	$1,191,000.00	$268,000.00	$1,528,000.00

PART V: PHYSICAL PLANT AND EQUIPMENT NEEDS

A. PHYSICAL FACILITIES

No additional physical facilities will be required for implementation of this plan. Extensive rehabilitation on reconstruction of dikes protecting croplands and canals and ditches will be required. Improvements to the drainage systems for croplands will require replacement or rehabilitation of several pumping facilities for efficient operation.

B. EQUIPMENT NEEDS

Generally, equipment now on hand will be sufficient for implementation of the plan. Farm tractors and farm equipment will require up-grading through replacement as advanced age of equipment dictates.

There is a need for a 3/4 C.Y. dragline for maintenance of the many ditches and canals found on the refuge, or sufficient funds available for contractual dragline work.

C. ENGINEERING SERVICES NEEDS

Major re-construction of dikes willrequire extensive engineering assistance, but should be accomplished under refuge development planning rather than the Soil and Moisture Conservation Program.

Engineering services for improvement of drainage for croplands, farm pumps and tiling are available from the Soil Conservation Service, through the local Soil Conservation District.

PART VI: FUNDS AND MANPOWER REQUIREMENTS

A. ANNUAL PROGRAM COSTS

FISCAL YEAR - 1973

ITEM	S&MC	BUREAU	COOP	TOTAL
Land Use Planning	$ - -	$ 2,400.00	$ - -	$ 2,400.00
Studies & Investigations	300.00	2,000.00	- -	2,300.00
Soil Management	700.00	3,000.00	30,000.00	33,700.00
Water Management	2,000.00	12,000.00	8,000.00	22,000.00
Program Facilities	- -	2,000.00	- -	2,000.00
Operations & Maintenance	- -	4,000.00	1,500.00	5,500.00
TOTAL FY-1973	$ 3,000.00	$ 25,400.00	$39,500.00	$67,900.00

FISCAL YEAR - 1974

ITEM	S&MC	BUREAU	COOP	TOTAL
Land Use Planning	$ - -	$ 1,000.00	$ - -	$ 1,000.00
Studies & Investigations	300.00	600.00	- -	900.00
Soil Management	5,000.00	7,600.00	40,000.00	52,600.00
Water Management	7,000.00	30,000.00	8,000.00	45,000.00
Program Facilities	- -	23,000.00	- -	23,000.00
Operations & Maintenance	700.00	3,000.00	700.00	4,400.00
TOTAL FY-1974	$13,000.00	$65,200.00	$48,700.00	$126,900.00

FISCAL YEAR - 1975

ITEM	S&MC	BUREAU	COOP	TOTAL
Land Use Planning	$ - -	$ 700.00	$ - -	$ 700.00
Studies & Investigations	1,000.00	600.00	- -	1,600.00
Soil Management	5,000.00	8,000.00	43,000.00	56,000.00
Water Management	6,000.00	50,000.00	8,000.00	64,000.00
Program Facilities	- -	40,000.00	- -	40,000.00
Operations & Maintenance	1,000.00	3,000.00	700.00	4,700.00
TOTAL FY-1975	$13,000.00	$102,300.00	$51,700.00	$167,000.00

FISCAL YEAR - 1976

ITEM	S&MC	BUREAU	COOP	TOTAL
Land Use Planning	$ - -	$ 700.00	$ - -	$ 700.00
Studies & Investigations	1,800.00	600.00	- -	2,400.00
Soil Management	4,200.00	7,700.00	45,000.00	56,900.00
Water Management	7,000.00	65,000.00	8,000.00	80,000.00
Program Facilities	- -	60,000.00	- -	60,000.00
Operations & Maintenance	1,000.00	3,000.00	700.00	4,700.00
TOTAL FY-1976	$14,000.00	$137,000.00	$53,700.00	$204,700.00

FISCAL YEAR - 1977

ITEM	S&MC	BUREAU	COOP	TOTAL
Land Use Planning	$ - -	$ 700.00	$ - -	$ 700.00
Studies & Investigations	1,200.00	600.00	- -	1,800.00
Soil Management	5,800.00	7,700.00	30,000.00	43,500.00
Water Management	7,000.00	150,000.00	8,000.00	165,000.00
Program Facilities	- -	60,000.00	- -	60,000.00
Operations & Maintenance	1,000.00	3,000.00	700.00	4,700.00
TOTAL FY-1977	$15,000.00	$222,000.00	$38,700.00	$275,700.00

FISCAL YEAR - 1978

ITEM	S&MC	BUREAU	COOP	TOTAL
Land Use Planning	$ - -	$ 1,500.00	$ - -	$ 1,500.00
Studies & Investigations	600.00	600.00	- -	1,200.00
Soil Management	3,400.00	7,000.00	27,000.00	37,400.00
Water Management	6,000.00	608,000.00	8,000.00	622,000.00
Program Facilities	- -	18,000.00	- -	18,000.00
Operations & Maintenance	1,000.00	4,000.00	700.00	5,700.00
TOTAL FY-1978	$11,000.00	$ 639,100.00	$ 35,700.00	$ 685,800.00
TOTAL F.Y. 1973 - 1978	$69,000.00	$1,191,000.00	$268,000.00	$1,528,000.00

B. MANPOWER

Average annual manpower needs for the implementation of this plan will be as follows:

MAN-MONTHS S&MC PROGRAM

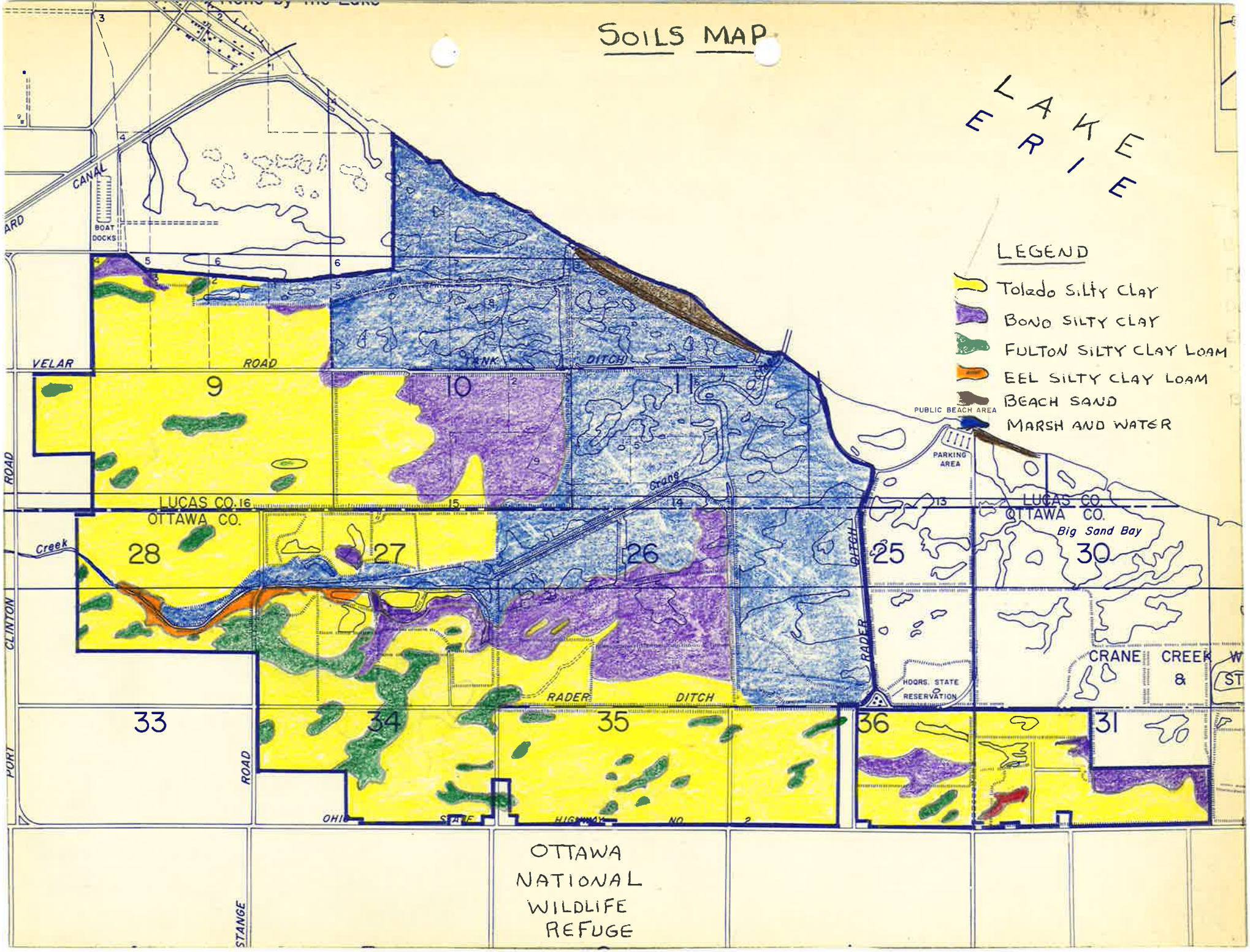
FUNCTION	PERMANENT	TEMPORARY	COOPERATOR	CONTRACTUAL
Land Use Planning	0.1			
Studies & Investigations	0.1			
Soil Management	0.5	1.0	18.0	
Water Management	0.5	1.5	4.0	1.5
Program Facilities	0.1			0.5
Operations & Maintenance	0.1	0.5	2.0	0.5
TOTALS	1.4	3.0	24.0	2.5

PART VII: PROGRAM DATA

APPENDIX A. Soils Map
APPENDIX B. Physical Facilities Map
APPENDIX C. Land Use Map

February 1, 1972

SOILS MAP


LAKE ERIE
LEGEND
Toledo Silty Clay
Bono Silty Clay
Fulton Silty Clay Loam
Eel Silty Clay Loam
Beach Sand
Marsh and Water
PUBLIC BEACH AREA
PARKING AREA
CANAL
BOAT DOCKS
VELAR ROAD
CLINTON PORT ROAD
STANGE ROAD
LUCAS CO.
OTTAWA CO.
Crane Creek
Big Sand Bay
RADER DITCH
HOORS STATE RESERVATION
CRANE CREEK & W ST
OHIO STATE HIGHWAY NO. 2
OTTAWA NATIONAL WILDLIFE REFUGE
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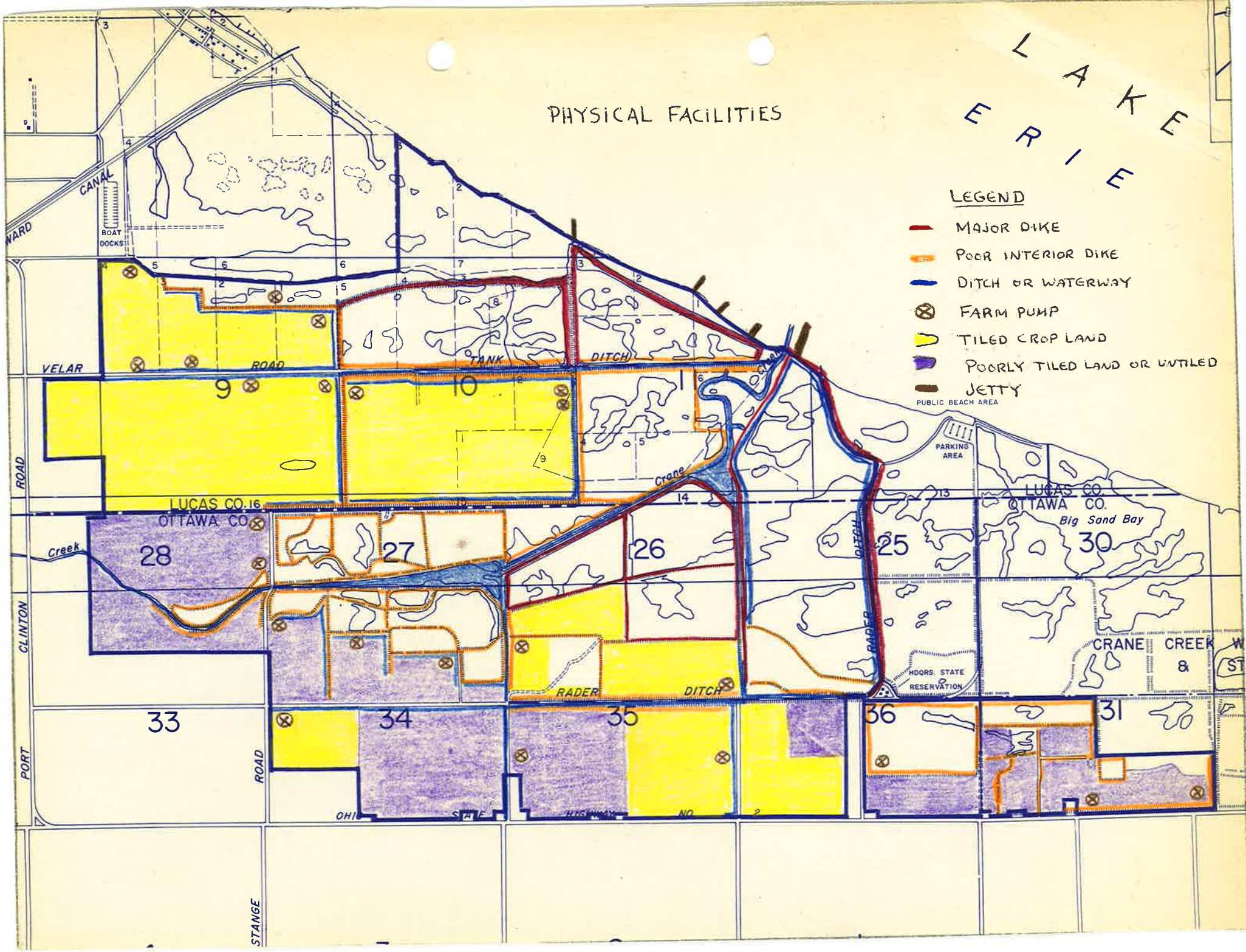
PHYSICAL FACILITIES
LAKE ERIE
LEGEND
MAJOR DIKE
POOR INTERIOR DIKE
DITCH OR WATERWAY
FARM PUMP
TILED CROP LAND
POORLY TILED LAND OR UNTILED
JETTY
PUBLIC BEACH AREA
CANAL
BOAT DOCKS
VELAR ROAD
TANK
DITCH
CLINTON ROAD
LUCAS CO.
OTTAWA CO.
Creek
Crane
PARKING AREA
Big Sand Bay
RADER DITCH
HDQRS. STATE RESERVATION
CRANE CREEK
PORT CLINTON ROAD
STANGE ROAD
OHIO STATE HIGHWAY NO. 2
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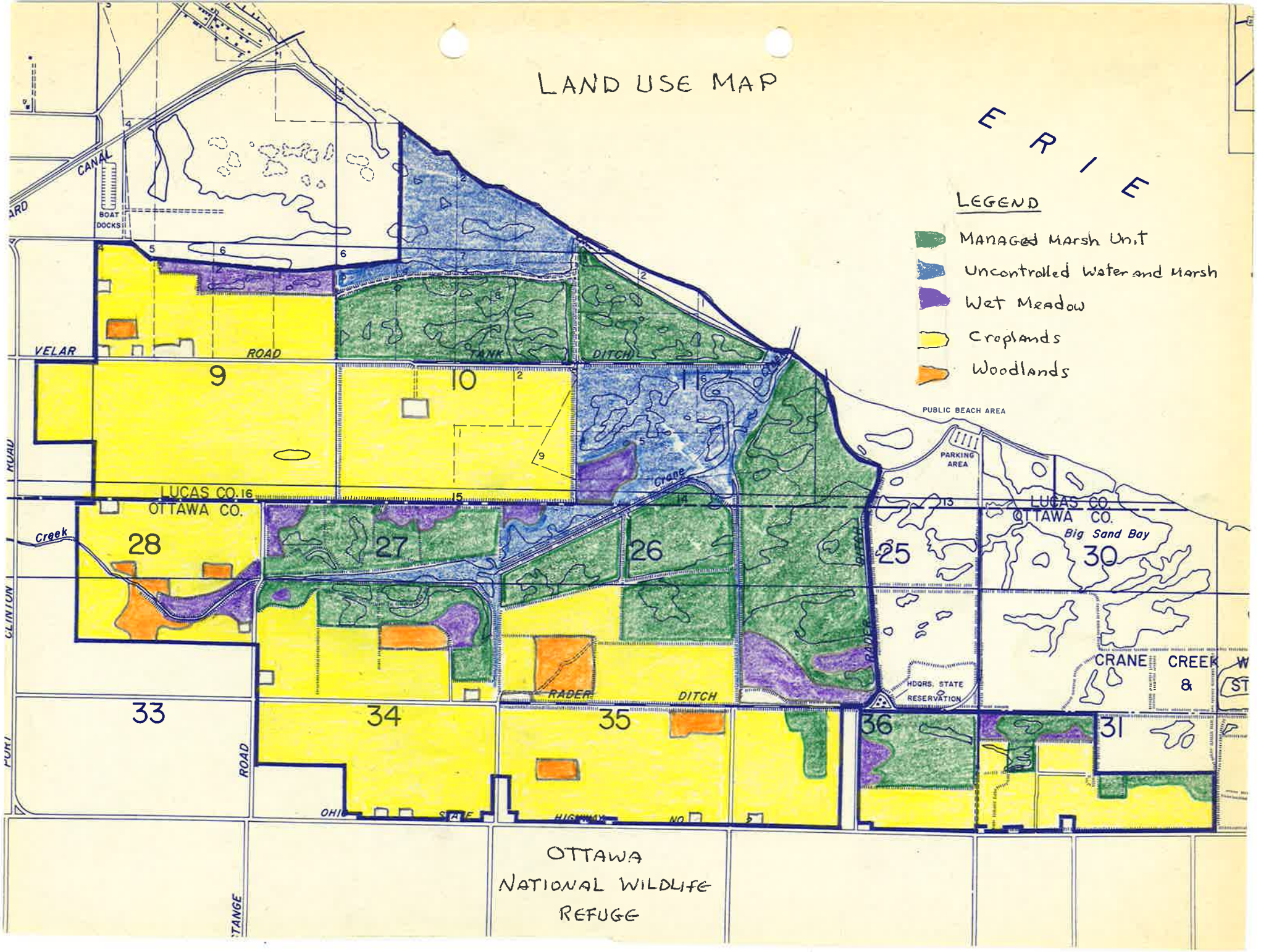
LAND USE MAP
ERIE
LEGEND
Managed Marsh Unit
Uncontrolled Water and Marsh
Wet Meadow
Croplands
Woodlands
CANAL
BOAT DOCKS
VELAR
ROAD
TANK
DITCH
PUBLIC BEACH AREA
PARKING AREA
LUCAS CO.
OTTAWA CO.
Creek
Big Sand Bay
CRANE
CREEK
&
HDQRS. STATE RESERVATION
RADER
DITCH
ROAD
OHIO
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OTTAWA
NATIONAL WILDLIFE
REFUGE